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MOISTURE RESISTANT FLOURESCENT LIGHT FIXTURE

BACKGROUND OF THE INVENTION

Field of the Invention:

The present invention relates to flourescent light fixtures for use in a high moisture environment, such as refrigerated trucks, which might be regularly steam cleaned.

Description of the Prior Art:

It has been known to make lighting fixtures with a generally rectangularly shaped pan to be recessed into the wall of a vehicle to be illuminated, such a device of this type is shown in U. S. Patent No. 5,171,085 to Jackisch and assigned to the assignee of the subject patent application. Such devices, while enjoying commercial success, are not generally adaptable for use in a high moisture environment.

Flourescent light fixtures have further been proposed for use in a high vapor environment. One such lighting fixture includes a frame secured to the perimeter of an opening in a wall for recess of the fixture and includes a channel shaped housing hingedly secured along one side to such frame and having a tubular gasket compressibly sandwiched between the parametrical flanges of such housing and an underlying lens. A device of this type is shown in US Patent No. 2791681 to Dunker.

Such devices suffer the shortcoming that the lens is typically held in position pressed against the gasket only by means of spring clips thus failing to afford a high integrity moisture resistant seal.

SUMMARY OF THE INVENTION

The present invention includes a light fixture pan formed with opposed side walls formed on their free extremities with downwardly facing mounting surfaces. Formed in such mounting surfaces are O-ring glands which receive longitudinal runs of an endless O-ring. The side walls are formed with laterally in turned mounting rails which engage grooves in the opposite edges of a channel shaped lens which is configured to, when engaged with such rails, press sealingly against such longitudinal rungs of the O-ring.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a broken bottom perspective view of a moisture resistant fluorescent light fixture embodying my new invention;

FIG.2 is a front view thereof;

FIG. 3 is a right hand end view thereof, partially broken away;

FIG. 4 is horizontal sectional view, in enlarged scale, taken along the lines 4-4 of FIG. 3;

FIG. 5 is a detailed sectional view, in enlarged scale, taken from the circle designated 5 in FIG.4;

FIG.6 is a transverse sectional view, in enlarged scale, of the light fixture shown in FIG.1;

FIG.7 is an enlarged in scale detailed view taken from the circle 7 in FIG. 6; and

FIG. 8 is a bottom view, in reduced scale, of the light fixture shown in FIG. 1 with the lens removed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to **FIGS. 1 and 6**, the moisture resistant fluorescent light fixture of the present invention includes, generally, a housing defined by a channel shaped pan **15** formed with opposite downwardly projecting side walls **17** and **19** terminating at their lower extremities in respective mounting flanges **21** and **23**. The respective mounting flanges **21** and **23** are formed with horizontal downwardly facing mounting surfaces **25** and **27** which are, in turn, formed with longitudinal O- ring gland runs **29** and **31**. The side walls **17** and **19** flare laterally outwardly at the respective flanges **21** and **23** and then turn to project downwardly and form respective laterally inwardly turned mounting rails **33** and **35** which engage the opposite edges of a rectangularly shaped lens, generally designated **41**. End caps, generally designated **43** and **45**, are mounted to the opposite ends of the pan **15** and are formed with the respective O- ring glands **47** and **49** which cooperate with the respective longitudinal run **49** and **31** for receipt of an O- ring **31** which cooperates with the lens **41** to form a moisture tight seal.

Referring to **FIGS. 3, 6 and 7**, the pan **15** may be constructed of, for example, extruded aluminum or any other desired desirable material. For the purpose of illustration, the construction will be described as if the fixture were to be mounted in a horizontally extending ceiling panel. The respective side walls **17** and **19** are formed on their respective exterior sides with longitudinally extending screw races **57** and **59** for receipt of respective mounting screws **61** projecting through the

end caps 43 and 45. The pan 15 may be mounted in a rectangular opening formed in the ceiling or the side wall of a refrigeration truck.

Referring to FIG 6, their respective side walls 17 and 19 are formed at the lower extremities to flare laterally in opposite directions, the laterally inwardly turned flare forming the respective longitudinally extending horizontal flanges 21 and 23 and the outwardly projecting flares forming respective webs 65 and 67 which mount at the other extremities thereof longitudinally projecting bezels, 69 and 71. Such bezels 69 and 71 project downwardly and are formed on their respective laterally interior sides with upwardly raised recesses, 70 and 72 which are configured on their respective lateral interior sides with longitudinally, projecting, horizontal lips defining the respective rails 33 and 35. Such rails are spaced laterally outwardly from the vertical planes of the respective gland runs 29 and 31 and, also, spaced downwardly a predetermined distance from the respective mounting surfaces 25 and 27 to cooperate in recessing the lens 41 and forcing it into sealing engagement with the O-ring.

Referring to FIG. 6, a channel shaped reflector, generally designated 75, is trapped in the interior of the pan 15 and opens downwardly. The reflector 75 is of generally angular construction formed with a horizontal top wall 77 and a right hand side wall angling downwardly and outwardly at an angle of about 45 degrees to the vertical to terminate in a bottom edge 81 engaged above the mounting flange 23 to cooperate in holding the reflector 75 in position. The reflector 75 is further formed with a left hand side wall which includes an intermediate spring wall 83 angling downwardly and outwardly at an angle of about 30 degrees to the vertical and then turning laterally and outwardly to form a foot 85 angling laterally outwardly and downwardly at an angle of about 20 degrees to the

horizontal to terminate in an edge **87** engaged behind the flange **21**. The reflector **75** may be constructed of aluminum, coated plastic, or any other desired material for carrying the light fixtures and reflecting the light from the tubes downwardly.

Referring to **FIGS. 6 and 8**, mounted to the underside at one end of the reflector top wall **77** is a fluorescent light socket fixture, generally designated **91**, into which the respective plugs at one end of a twin light assembly formed by two fluorescent light tubes **93** and **95** carried cantileverally from a plug. Referring to **FIG. 6** mounted above the wall **85** of the reflector **75** and interposed between the spring wall **83** thereof and the side wall **17** of the pan, is the ballast and electrical circuit assembly, generally designated **97**, for energizing the plug mounting the light tubes **93** and **95**.

The respective end caps **43** and **45** are of similar construction and are essentially mirror images of one another. The end cap **43** includes a generally planer vertical end wall **101** (**FIG.3**) for disposition in an abutting relationship with the adjacent end of the pan **15**. Such end wall **101** flares slightly outwardly at the bottom extremity thereof to form respective ears formed with respective bores for receipt of respective mounting screws **61** that screw into the respective screw races **57**.

Such end walls **101** are formed at the top and opposite sides with longitudinally inwardly turned stub walls **103** and **105** which are configured to be telescopically received over the respective opposite marginal ends of the pan .

Referring to **Fig. 8**, the end caps are formed at their respective bottom extremities with longitudinally outwardly flared bezels **107** which complementary join with the respective side bezels **69** and **71** on the opposite sides of the pan **15** and are further formed with laterally elongated upwardly recessed, downwardly facing mounting surfaces **109** which are formed to complement the

transverse shape of the top side of the lens **41** (**FIG 8**). Such caps are configured with respective C-shaped horizontally extending O- ring glands opening into the respective mounting surfaces **109** and are configured with respective lateral runs **111** which turned longitudinally at their opposite ends to form with their respective longitudinal stub glands **113** and **115** which, when the end caps are in position, align with the respective longitudinal runs **33** and **35** formed in the respective flanges **21** and **23**. Formed in the respective laterally projecting mounting surfaces **109** are respective lens mounting bores **117** and **119** spaced laterally apart for receipt of respective mounting screws **121** and **123** projecting through laterally spaced bores in the opposite ends of the lens **41** and screwed into such bores themselves. The upward recess of the end cap mounting surfaces **109** cooperate with the upward recesses in the side bezels **69** and **71** to cooperate in forming a rectangular recess for the lens **41** to nest in.

Referring to **FIG. 4** and **5**, the junctures between the ends of the pan and the respective end caps are sealed by a sealing compound **106** or such other sealing gasket or material as may be desired to create a moisture resistant joint.

Referring to **FIG. 6**, the lens **41** is constructed of a fairly rigid, tough, impact resistant plastic about 1/8" thick and is somewhat channel shaped to be formed with a generally horizontal pane **129** which curves upwardly at the lateral opposite edges and is formed with laterally outwardly projecting flat lands **130** and **131** which are configured to press upwardly against the bottom sides of the longitudinal runs of the O-ring **51** as shown in **FIG. 7**. The lens is then formed at its opposite terminal edges with respective longitudinally extending bosses configured with outwardly opening grooves **133** and **135** spaced above the plane of pane **129** to engage the respective rails **33** and **35**

to securely fasten the lens 41 in position with the lands 130 and 131 in tight sealing engagement compressing the O-ring.

During manufacturing, the moisture resistant light fixture of the present invention may be conveniently constructed from extruded aluminum to form the channel shaped pan 15. The reflector 75 may be formed of aluminum sheet metal bent to the channel shaped configuration shown in FIG. 6.

The end caps 43 and 45 may be molded to the desired configuration for complementary connection with the opposite ends of the pan 15. Such end caps may be joined to the respective opposite ends of the pan 15 at the juncture there between sealed by the compound 106. The screws 61 may be extended through the bores in the opposite walls 101 of the respective end caps and threaded into the respective screw races 57 and 59. The plugs fixture 91 may be riveted or otherwise fastened to the top wall 77 of the reflector.

The ballast and electrical circuit assembly 97 may be nested into the corner of the pan 15 adjacent to the side wall 17 and the reflector 77 conveniently introduced to such pan by flexing the respective side wall 79 and spring wall 83 to clear the lateral outer extremities of the respective mounting flanges 21 and 23 and nest the respective terminal edges 81 and 87 of the respective walls 79 and 85 in the position shown in FIG. 6 to resiliently hold the reflector in place capturing the ballast and circuit assembly 97 in position. The light tubes 93 and 95 may then be installed.

In some embodiments, the ballast and circuit assembly 97 is affixed to the spring wall 83 of the reflector by riveting or the like so as to form an interval of assembly for convenient inventorying, assembly, and shipping.

The lens **41** may conveniently be installed by merely clipping one of the grooves **133** or **135** over the respective retainer rail **33** or **35** and inserting the blade of a broad blade screw driver into the recess **71** or **72** (**FIG. 6**) at the other side of such lens to leverage that side lens toward the first to flex the central body of such lens sufficiently downwardly to allow such opposite side of the lens to clear the associated rail to be raised into position compressing the longitudinal runs of the O-ring and aligning the confronting rail. Such lens may then snap back into the position shown in **FIG. 6** to be held firmly in position in compressing sealing engagement with the O-ring **51** as shown in **FIG. 7**. It is important that the lens have sufficient body and that the rails of the O-ring be so configured that by snapping the lens in place, a moisture resistant seal is created. The screws **121** and **123** may then be inserted through the lens and screwed into the respective bores **117** and **119** in the opposite end caps to likewise maintain a secure sealing engagement with the transverse rungs of the O-ring **51**.

The light fixture of the present invention may conveniently be installed in rectangular opening cut in the side walls or top wall, for instance a refrigeration truck. The pan **15** may be recessed therein and the bezels **69**, **71**, and **107** will serve to overly the edges thereof. Mounting screws may be inserted through the mounting holes **110** of the end cap bezels to secure the fixture in position.

Then, when the truck is cleaned with, for instance high pressure water or steam, the light tubes **93** and **95** and associated circuitry and plugs will be protected from the moisture. The O-ring, being thoroughly compressed in place by the lens **41**, will serve to form a high integrity barrier to entry of moisture or vapor. Likewise, the sealing compound or gasket material **103** (**FIG. 5**) at the

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end cap juncture will serve to seal out moisture. As will be apparent to those skilled in the art, the configuration of the mounting flanges, mounting rails, and lens may take many different forms, it only being important that the lens and rail combination cooperate to afford the sufficient compressive forces to, when such lens is locked in position, provide the desired water barrier.

In us, should the lens be accidentally impacted by a package of produce, meat or the like, the high impact plastic will resist fracture and the screw fasteners will resist separation from the pan.

When it is desirable to change a light tube assembly, the blade of a broad blade screw driver may be inserted into one or the other of the other of the recesses 70 or 72 adjacent the edge of the lens and that edge pried laterally inwardly relative to the respective bezels 69 or 71. With this prying, either the lens can flex to buckle somewhat in the lateral direction to clear the selected groove boss from the rail 33 or 35 or, in some embodiments, the bezels 69 or 71 will flex to accommodate such clearance. In other embodiments, it will be in combination of flexing between elements prying apart. In any event, once the rail on one side is cleared, the lens can be removed and access had to the tube assembly.

In the event it is necessary to access the ballast assembly 97, the technician can press the reflector 15, upwardly in the pan 15. In some embodiments, access can be had to the top side of the reflector 75 from clearance openings formed between one end or the other of the reflector and the corresponding end cap so the lower extremity of the spring wall 83 may be flexed laterally inwardly as the reflector is moved bodily to the right as viewed in FIG. 6 thus flexing the angular wall 79 so as to cooperate in creating clearance for the marginal edge 87 and the foot 85 to clear the innermost

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extent of the flange 21 for removal of such reflector. Access can then be had to the ballast assembly 97 for repair work or exchange.

After repair work is completed, the reflector may be re-installed as during the assembly stage and the lens 41 then again attached to maintain the compressive sealing barrier described above.

From the foregoing it would be appreciated if the moisture resistant light fixture of the present invention is economical to manufacture, convenient to assemble and install, while providing for resistance to penetration therein of moisture that as might be the case for refrigerated trucks which are cleaned periodically with high pressure water and even sometimes steam.